

## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to image forming devices, such as a copying machine, a facsimile, and a printer, carries out primarily transferring of the toner image formed on image support to an intermediate transfer body in detail, and relates to the image forming device of the intermediate transfer system which transfers the toner image on this intermediate transfer body secondarily to a transfer material.

[0002]

[Description of the Prior Art]The image forming device of the intermediate transfer system which piles up conventionally two or more toner images formed in image support one by one one by one as this kind of an image forming device on the intermediate transfer body which carries out endless movement, transfers the first [ in all ] order, and transfers the primarily transferring picture (toner image) on this Nakama \*\* object secondarily collectively to a transfer material is known. The point of attaining a miniaturization in recent years, and in that there are few restrictions of the kind of transfer material with which a visual image is transferred eventually, since the image forming device using this intermediate transfer system is advantageous, it is in the tendency to be used especially as a color image forming device.

[0003]In such an image forming device, in order to prevent the inferior transfer at the time of the primarily transferring of each color toner image, and secondary transfer, the art of applying lubricant to the surface of image support or an intermediate transfer body, and reducing adhesion force with a toner is already known.

[0004]And these people make it rotate previously, contacting an application brush to solid lubricant (henceforth solid lubricant), The method of making transfer lubricant on an application brush and applying to coated member surfaces, such as image support and an intermediate transfer body, is proposed (refer to JP,6-332324,A and JP,10-254295,A). Coefficient-of-static-friction mus to the toner of a coated member surface is reduced, and it enables it to transfer a toner image good to the transfer material side by this.

[0005]

[Problem(s) to be Solved by the Invention]However, even if it applied lubricant, it turned out that transfer of a toner image is not performed good but there are various abnormal images, such as a middle omission in the picture part called what is called [ "worm-eaten" ], a shortage of toner adhesion of the picture part to which it "image blurring" [ what is called ] Flies, and a \*\*\*\*\* picture called what is called "BOSOTSUKI."

[0006]Here, since the toner remains also after transferring a toner image, it is necessary to the above-mentioned coated member surface to also carry out cleaning of residual toner. And the

physical relationship on the coated member of two processes of spreading of lubricant and the cleaning of residual toner which are performed after transfer can consider the following two patterns. That is, lubricous agent application is two patterns, the relation of the after-spreading cleaning which cleaning turns into the back at the point, and the relation of after-cleaning spreading which lubricous agent application turns into the back at the point in cleaning. With each pattern, since the mechanisms of abnormal image generating differ, it divides and explains for every pattern below.

[0007]First, the mechanism of abnormal image generating in the pattern of after-spreading cleaning is explained. Drawing 4 is the elements on larger scale near the lubricous agent application part which have the composition of the above-mentioned after-spreading cleaning. As shown in this figure, it is provided in the coated belt 1 surface which is image support or an intermediate transfer body so that the application brush 80 as an applying member may contact, and the cleaning blade 15a is contacted by the direction downstream of surface migration of the coated belt 1. After lubricant is applied to the coated belt 1 surface with the application brush 80 by this, the surface is cleaned by the cleaning blade 15a by it. In such after-spreading cleaning, lubricant will be applied to the coated member surface in the state where the toner remains without being removed. Here, as for the portion which hits a character part among the pictures which were being supported to the coated member surface from the first, also after transferring to a transfer material, a lot of residual toner exists in a coated member surface, and as for any portions other than a character part, residual toner does not exist substantially. And since a lot of lubricant is scratched with the toner by the cleaning blade in an application brush and a cleaning position, etc., a bias will arise from a place with much coating weight of residual toner in the coverage of lubricant in the coated member surface after passing through a cleaning position. When an identical image is outputted especially continuously, since the portion with much residual toner is always the same, such a bias becomes remarkable among coated member surfaces. Since residual toner adheres to applying members, such as an application brush, an application brush becomes dirty and it becomes difficult to continue applying lubricant uniformly over a long period of time. And if a uniform lubricant layer cannot be formed in a coated member surface, a bias does not arise in surface coefficient-of-static-friction mus, or it does not become a value sufficiently low in order to transfer a toner, and transfer unevenness will arise and they will be abnormal images, such as worm-eaten, image blurring, and BOSOTSUKI.

[0008]Next, the mechanism of abnormal image generating in the pattern of after-cleaning spreading is explained. Drawing 5 is the elements on larger scale near the lubricous agent application part which have the composition of the above-mentioned after-cleaning spreading. As shown in this figure, it is provided in the coated belt 1 surface which is image support or an intermediate transfer body so that the application brush 80 as an applying member may

contact, and the cleaning blade 15a is contacted by the direction upstream of surface migration of the coated belt 1. After the coated belt 1 surface is cleaned by the cleaning blade 15a by this, lubricant is applied by the application brush 80. Since lubricant after spreading will not be scratched by the application brush and a cleaning blade if such after-cleaning spreading is performed, the fault in the composition of the aforementioned after-spreading cleaning can be prevented. However, when the coated member surface where lubricant was applied advanced into the transfer position as it is and transfer was performed, although surface coefficient-of-static-friction mus was in the appropriate range, it turned out that it is generated by the abnormal image. Since the particles of lubricant were not so fine as it serves as a uniform layer only by applying as for this, it turned out that it is because nonuniformity will arise in thickness in a coated member surface and this will affect the transfer nature of a toner. If a uniform lubricant layer cannot be formed in a coated member surface, surface coefficient-of-static-friction mus does not become uniform, or it does not become a value sufficiently low in order to transfer a toner, and transfer unevenness will arise and they will be abnormal images, such as worm-eaten, image blurring, and BOSOTSUKI.

[0009]Here, these people have proposed previously the thing which enabled it to apply lubricant uniformly to a coated member in JP,7-295451,A and JP,10-260614,A. Above-mentioned JP,10-260614,A makes possible uniformly coating of lubricant to image support by raising the density of the hair of the application brush for applying lubricant among these. Above-mentioned JP,7-295451,A makes uniformly coating of lubricant possible by applying to a support member, after equalizing the quantity of the lubricant currently supported by the lubricant support member on a lubricant support member. However, in above-mentioned JP,10-260614,A, since the support member surface is cleaned after spreading of lubricant, adhesion of residual toner in an application brush cannot be prevented thoroughly. Above-mentioned JP,7-295451,A, It was not indicated that it was not for performing uniformly coating of lubricant in order to raise the cleaning performance of the support member to which lubricant was applied, and preventing the above-mentioned fault on a transfer picture, and the above-mentioned fault could be prevented also as an effect.

[0010]This invention is made in view of the above background, and the place made into the purpose is providing the image forming device which can obtain the good transfer picture which does not have abnormal images, such as worm-eaten, image blurring, and BOSOTSUKI, in a transfer picture in the image forming device of an intermediate transfer system.

[0011]

[Means for Solving the Problem]This invention to achieve the above objects an image forming device of claim 1, It has image support which supports a toner image on the surface which carries out endless movement, and an intermediate transfer body which supports this toner

image by having the surface which carries out endless movement and carrying out primarily transferring of the toner image on this image support in an opposed position with this image support, An image forming device which transfers secondarily a toner image supported on this intermediate transfer body to a transfer material is characterized by comprising:

A lubricous agent application means to apply lubricant to toner image an unsupported field before supporting a toner image of at least one surface of the above-mentioned image support and the above-mentioned intermediate transfer body.

A cleaning means which cleans a coated member surface before this lubricant is applied.

A lubricant equalizing means which levels uniformly lubricant applied by this lubricous agent application means on this coated surface.

[0012]In an image forming device of claim 1, in at least one surface of image support and an intermediate transfer body, it is toner image an unsupported field before supporting a toner image, and after removing residual toner etc. which remained on the surface by a cleaning means, lubricant is applied by a lubricous agent application means. Lubricant is applied to a coated member surface without foreign matter adhesion, such as residual toner, by this. Then, the surface is uniformly leveled for applied lubricant by a lubricant equalizing means. Even when applying lubricant by this after cleaning residual toner, a uniform layer of applied lubricant can be formed.

[0013]In an image forming device of claim 1, a brush like member which applies lubricant to this coated member surface in contact with a coated member surface was used for an image forming device of claim 2 as the above-mentioned lubricous agent application means.

[0014]In an image forming device of claim 2, in order to apply lubricant, an application brush in which composition is easy and cheap is used. In this invention, it becomes possible to apply lubricant good over a long period of time, without foreign matters, such as residual toner, adhering to a brush like member, since a brush like member can be made to be able to contact a coated member surface without foreign matter adhesion, such as residual toner, and lubricant can be applied.

[0015]In claim 1 or an image forming device of 2, a lubricant equalization blade was used for an image forming device of claim 3 as the above-mentioned lubricant equalizing means.

[0016]Lubricant applied to a coated member surface is uniformly leveled with a braid, before making this surface support a toner image, and it enables it to form a uniform layer of lubricant certainly in an image forming device of claim 3.

[0017]An image forming device of claim 4 constituted the above-mentioned lubricant equalization blade from an elastic body in an image forming device of claim 3.

[0018]Lubricant applied to a coated member surface is leveled with a lubricant equalization blade of an elastic body, and even if a lubricant equalization blade does not expect but it

contacts a coated member surface, it is made for a lubricant equalization blade to absorb a shock to a coated member surface in an image forming device of claim 4. Where a lubricant equalization blade is contacted to a coated member surface from the first, when arranging, a lubricant equalization blade absorbs a shock a coated member surface is shocked by relative displacement of a coated member surface and a lubricant equalization blade.

[0019]In claims 1, 2, and 3 or an image forming device of 4 an image forming device of claim 5, A coefficient of static friction of  $\beta$  and the above-mentioned transfer material surface is set to  $\gamma$ , and a coefficient of static friction on the above-mentioned surface of image support was made for a relation to  $\alpha \leq \beta \leq \gamma$  of  $\alpha$ ,  $\beta$ , and  $\gamma$  to become about a coefficient of static friction of  $\alpha$  and the above-mentioned intermediate transfer body surface.

[0020]Here, adhesion force of a toner becomes large, so that surface coefficient-of-static-friction  $\mu_s$  is large. And transfer nature is not spoiled when adhesion force of a toner transfers a toner image from a small field to a large field. On the contrary, when adhesion force of a toner transfers a toner image from a large field to a small field, it remains to a transferring agency, without transferring to a toner, or reverse transcription of the toner is carried out, and it becomes easy to generate inferior transfer.

[0021]It is made for surface coefficient-of-static-friction  $\mu_s$  of a transferring agency to become to an intermediate transfer body surface in an image forming device of claim 5 in composition with which a toner image is transferred one by one from an intermediate transfer body surface from the image support surface to a transfer material surface below in surface coefficient-of-static-friction  $\mu_s$  of a transfer place. By this, inferior transfer of a toner image by transferring a toner image from the surface large coefficient-of-static-friction  $\mu_s$  side to a small side is prevented. In this image forming device, since lubricant is applied to at least one surface among image support and an intermediate transfer body and applied lubricant can be formed in the shape of [ uniform ] a layer in order to make a surface coefficient of static friction become the above-mentioned relation, transfer nature can be raised certainly.

[0022]

[Embodiment of the Invention]Hereafter, the embodiment which applied this invention to the color copying machine as an image forming device is described. First, the outline composition and operation of a color copying machine concerning this embodiment are explained. Drawing 1 is an outline lineblock diagram of the whole color copying machine concerning this embodiment. In drawing 1, the belt shape photo conductor (the following "photo conductor belt" is called) 1 as image support is constructed among the rotation rollers 2 and 3, and rotates in the direction (clockwise rotation) of figure Nakaya seal A by the drive of the rotation rollers 2 and 3. The electrification unit 4 as an electrifying means uniformly charged in the photo conductor surface around the photo conductor belt 1, an electric discharge lamp, The

laser writing unit 5 as an exposure device for electrostatic latent image formation, the cleaning unit 15 for photo conductor belts, yellow, The revolver developer 6 grade provided with magenta, cyanogen, and four development units that accommodated the black developer (a toner is called hereafter), respectively in one is allocated. The revolver developer 6 has on the circumference a mechanism which chooses the above-mentioned development unit by 90 rotations.

[0023]The semiconductor laser which omitted the graphic display, respectively, the polygon mirror rotated with the drive motor, a f-theta lens, and a mirror are stored into a unit case, and the above-mentioned laser writing unit 5 is built into the lower part of a device main frame.

[0024]The intermediate transfer belt 10 as an intermediate transfer body is formed in the coiling-round portion to the rotation roller 3 of the above-mentioned photo conductor belt 1 upper part so that this portion may be contacted. This intermediate transfer belt 10 is constructed so that it may incline among the belt rotation rollers 11 and 12, and it rotates in the direction (counterclockwise rotation) of figure Nakaya seal B by the drive of the belt rotation roller 11. It is provided in the intermediate transfer belt rear face of the contact portion with the photo conductor belt 1 so that the bias roller 13 which has conductivity may contact. The transfer roller 14 as a secondary transfer means is formed in the coiling-round part to the belt rotation roller 11 of the intermediate transfer belt 10 so that the cleaning unit 16 for intermediate transfer belts may be attached and detached to the intermediate transfer belt 10.

[0025]The cleaning unit 15 for photo conductor belts is provided with the cleaning blade 15a, the abandonment toner recovery containers 15b and 15c, etc. which clean the residual toner on the photo conductor belt 1. The cleaning unit 16 for intermediate transfer belts is provided with the cleaning blade 16a which cleans the surface of the intermediate transfer belt 10, the ocre 16b for toner transportation, etc. The cleaning blade 16a for intermediate transfer belts is maintained at the position estranged from the surface of the intermediate transfer belt 10 during image formation, and is contacted by the surface of the intermediate transfer belt 10 like a graphic display of only the time of the cleaning after secondary transfer.

[0026]The abandonment toner scratched from the intermediate transfer belt 10 is conveyed in the direction of drawing this side by the ocre 16b formed in the cleaning unit 16 for intermediate transfer belts, and is further conveyed by the abandonment toner recovery container 15c by the transportation part which omitted the graphic display. By this, the abandonment toners scratched by the cleaning blades 15a and 16a from the photo conductor belt 1 and the intermediate transfer belt 10, respectively are collected by the recovery container 15c, When the abandonment toner more than the specified quantity is accommodated in the recovery container 15c, the recovery container 15c is exchanged suitably.

[0027]Lubricant is applied by the application means provided with the photo conductor belt 1 in

the cleaning unit 15. Lubricant is similarly applied by a lubricous agent application means by which it had the intermediate transfer belt 10 in the cleaning unit 16. These photo conductor belt 1 and the intermediate transfer belt 10 serve as a coated member in this embodiment, and since it is a feature section of this embodiment, a lubricous agent application means is explained in full detail later.

[0028]The above-mentioned photo conductor belt 1, the electrification unit 4, the intermediate transfer belt 10, the cleaning units 15 and 16, etc. are constituted in one as the process cartridge 31, The abandonment toner recovery container 15c is incorporated removable to the process cartridge 31, and it is constituted so that it can exchange at the time of life arrival. The above-mentioned revolver developer 6 can also be exchanged now at the time of life arrival. In order to make easy such convertibility and processing of a paper which carried out jam, the previous frame 8 of a color copying machine body has structure which can be opened. The case armored part by the side of the resist roller pair 20 of the process cartridge 31 is provided also with the function as a conveyance guide of the transfer paper conveyed by the transfer section from the feeding base 12.

[0029]Drawing 2 is an explanatory view showing the state where the opened condition of the previous frame 8 of a color copying machine was carried out. Focusing on the rotary support shaft 9a which is provided in the body frame 9 and passes along the center of rotation of the belt rotation roller 12, the previous frame 8 is supported so that opening and closing are possible, and it is usually in the state where it closed to the body frame 9. And when making the previous frame 8 open wide, the locking mechanism (a graphic display is omitted) of the previous frame 8 is canceled, and as shown in drawing 2, the previous frame 8 is opened. The conveying roller pair 19 which constitutes a part of transfer paper conveying path, the resist roller pair 20, and the transfer roller 14 grade are held at the previous frame 8, and if the previous frame 8 is made to open wide, these members will also move about the previous frame 8. By this, a transfer paper conveying path can be exposed and exchange of the abandonment toner recovery container 15c, processing of a jamming form, etc. can be performed now. Thus, reinforcement of a process cartridge can also be attained by exchanging the abandonment toner recovery container 15c. When performing the switching action of the previous frame 8, various units about imaging are immobilization and faults, such as toner scattering and disclosure, are produced.

[0030]Image formation operation is explained in the color copying machine of the above-mentioned composition. The photo conductor belt 1 is exposed by scanning laser beam L modulated based on picture information with the laser writing unit 5, after being uniformly charged with the electrification unit 4, and an electrostatic latent image is formed in the surface. Thus, the picture information used for exposure is the monochromatic picture information which disassembled the desired full color image into yellow, magenta, cyanogen,

and black sexual desire news. Rotating scanning of the laser beam L generated by the semiconductor laser which had the graphic display omitted based on this picture information is carried out by the polygon mirror rotationally driven at high speed with the drive motor, and optical-path adjustment is carried out by a reflective mirror through a f-theta lens.

[0031]Monochrome development of the electrostatic latent image formed on the above-mentioned photo conductor belt 1 is carried out by the revolver developer 6 with predetermined yellow toner, magenta toner, a cyanogen toner, and black toner, respectively, and each color image (toner image) is formed one by one on the photo conductor 1.

[0032]Each monochrome image (toner image) formed on the photo conductor belt 1 rotated in the direction of arrow A in drawing 1, It piles up one by one for every yellow, magenta, cyanogen, and black monochrome by the predetermined transfer bias impressed to the bias roller 13 on the intermediate transfer belt 10 which rotates in the direction of arrow B synchronizing with the photo conductor belt 1, and the first [ in all ] order is transferred. The yellow piled up on the intermediate transfer belt 10, magenta, cyanogen, and a black picture, On the recording medium which timing was taken through the feed roller 18, the conveying roller pair 19, and the resist roller pair 20 from the feeding base (sheet paper cassette) 17, and was conveyed by the transfer section, it \*\*\*\*\* with the transfer roller 14 and a secondary copy is carried out. A full color image is completed by being established with the anchorage device 50 after the end of secondary transfer. The recording material with which this full color image was formed is discharged by the delivery stack part 52 through the paper ejecting roller pair 51.

[0033]At the time of a repeat copy, the image formation to the photo conductor belt 1 progresses to the imaging process of the 2nd sheet, for example, a yellow (one amorous glance) picture, to predetermined timing following on the imaging process of the 1st sheet, for example, a black (four amorous glance) picture. Following on second [ a total of ] transfer process to the recording medium of 4 color pile pictures of the 1st sheet, the primarily transferring of the yellow toner image of the 2nd sheet is made to carry out the direction of the intermediate transfer belt 10 to the field cleaned by the cleaning blade 16a in the surface. After that, it becomes the same operation as the 1st sheet.

[0034]Although the above was explanation of the copy mode which obtains 4 color FURUKARA, when it is 3 color copy mode and 2 color copy mode, the same operation as the above will be performed about the part of the specified color and the number of times. In the case of monochrome copy mode, only the development unit of the color is changed into a developing operation (\*\*\*\*\*) state until a specified number is completed, The 1 constant speed drive of the intermediate transfer belt 10 is carried out in the both-way direction, with the photo conductor belt 1 contacted, and also copy operation is performed in the state where the belt cleaning blade 16a has also contacted the intermediate transfer belt 10.



[0035]Now, lubricant is applied to the photo conductor belt 1 surface and the intermediate transfer belt 10 surface, and it enables it to maintain both coefficient-of-static-friction mus to a proper value in this embodiment. Here, since the lubricous agent application means to the photo conductor belt 1 and the lubricous agent application means to the intermediate transfer belt 10 are the same composition, the lubricous agent application means to the photo conductor belt 1 is explained below at an example. Drawing 3 is the elements on larger scale near [ concerning this embodiment ] the lubricous agent application machine, and carries out partial expansion of the circumference of the lubricous agent application machine 80 as a lubricous agent application means to apply lubricant to the photo conductor belt 1. This lubricous agent application machine 80 is provided with the following.

It is provided in the cleaning unit 15 for the photo conductor belts 1, and is the solid lubricant 81.

The brush roller 82 as a brush like member for applying this solid lubricant 81 to the photo conductor belt 1.

After the solid lubricant 81 dissolves the lubricating oil additive which uses zinc stearate as the main ingredients, cooling solidification of it is carried out, and it is molded into bar shape. The solid lubricant 81 is held at the lubricous chemical agent holding part material 83, and is pressing the solid lubricant 81 against the brush roller 82 side via lubricous chemical agent holding part material with the pressurization spring attached to the photo conductor belt cleaning unit housing 15d. The brush roller 82 is formed in contact with the photo conductor belt 1, and the lubricant which adhered the solid lubricant 81 to scraping and the brush roller 82 by rotation of the brush roller 82 at the brush roller 82 side adheres to a photo conductor belt surface from a contact part with the photo conductor belt 1.

[0036]It is possible to use dry solid hydrophobic lubricant as the above-mentioned solid lubricant 81, Besides zinc stearate, barium stearate, lead stearate, a thing with stearic acid groups, such as stearic acid iron, stearic acid nickel, stearic acid cobalt, copper stearate, stearic acid strontium, calcium stearate, cadmium stearate, and magnesium stearate, -- \*\*\*\* -- things are made. The zinc oleate, manganese oleate, oleic acid iron which are the same fatty acid groups, Oleic acid cobalt, lead oleate, magnesium oleate, copper oleate, \*\*, PAL thymic acid, zinc PAL cobalt thymate, copper palmitate, PAL magnesium thymate, PAL aluminum thymate, and PAL calcium thymate may be used. For others, metal salt of fatty acid, such as caprylic acid lead, caproic acid lead, linolenic acid zinc, linolenic acid cobalt, linolenic acid calcium, and Rico linolenic acid cadmium, and fatty acid, etc. can be used. Waxes, such as a candelilla wax, carnauba wax, a rice wax, haze wax, the Ohba oil, beeswax, and lanolin, etc. can be used.

[0037]Next, the feature section of this embodiment is explained. The cleaning blade 15a as a cleaning means is made to contact the photo conductor belt 1 surface of the upstream of the

move direction in this embodiment to the lubricous agent application position by the above-mentioned brush roller 82, And the lubricant equalization blade 85 as a lubricant equalizing means is made to contact the photo conductor belt 1 surface of the downstream of the move direction to a lubricous agent application position. A counter direction to the above-mentioned lubricant equalization blade 85 is made for the above-mentioned cleaning blade 15a to contact from the direction of trailing to the photo conductor surface in this embodiment to the photo conductor belt 1 surface. These cleaning blades 15a and the lubricant equalization blade 85 comprise rubber which is both an elastic body.

[0038] In the above composition, the residual toner which remained on the photo conductor belt 1 surface after carrying out primarily transferring of the toner image supported on the surface to the intermediate transfer belt 10 is first removed by the cleaning blade 15a. The brush roller 82 contacts the photo conductor belt 1 surface which changed into the clean state, and lubricant is applied to it by this. When the applied lubricant passes through the contact position of the lubricant equalization blade 85 by the photo conductor belt surface move direction downstream, the surface is leveled, and it can be extended uniformly and serves as a layer of lubricant with uniform thickness.

[0039] As mentioned above, after cleaning residual toner, apply lubricant, and also level lubricant and by [ uniform ] making it stratified, Both above-mentioned faults which are produced the case of the after-spreading cleaning which cleans the photo conductor belt 1 only after lubricous agent application, and in after-cleaning spreading which applies lubricant after cleaning can be prevented. Namely, by after-spreading cleaning, a bias arises in the coverage of lubricant, and a bias arises in a surface coefficient of static friction, or by after-cleaning spreading. Generating of abnormal images, such as worm-eaten, image blurring, BOSOTSUKI, etc. which originate in the ability not to form a uniform lubricant layer in the photo conductor belt 1 surface, and are produced, can be prevented, and the spreading function of the brush roller 82 is also maintainable over a long period of time. Even if it drives the photo conductor belt 1 where a lubricant equalization blade is contacted since rubber is used for the lubricant equalization blade, the photo conductor belt 1 surface does not get damaged.

[0040] As already stated, the composition which cleans by the belt surface move direction upstream of lubricous agent application, and performs \*\*\*\* of lubricant by the downstream is provided also to the intermediate transfer belt 10 only to the photo conductor belt 1. Therefore, in addition to the lubricous agent application machine 90 and the cleaning blade 16a, the lubricant equalization blade (a graphic display is omitted) is similarly allocated in the cleaning unit 16 of the intermediate transfer belt 10. The same effect as the photo conductor belt 1 can be acquired also to the intermediate transfer belt 10 by this.

[0041] In this embodiment, the relation between the coefficients of static friction  $\alpha$  and  $\beta$

on the final photo conductor belt surface after lubricous agent application and the surface of an intermediate transfer belt and the coefficient of static friction  $\gamma$  of a transfer paper in  $\alpha \leq \beta \leq \gamma$  has chosen the lubricant applied to the photo conductor belt 1 and an intermediate transfer body belt so that it may become. By this, it is made for surface coefficient-of-static-friction  $\mu$  of a transferring agency to always become below in surface coefficient-of-static-friction  $\mu$  of a transfer place, and the inferior transfer of a toner image can be prevented.

[0042]The relation to  $\alpha \leq \beta \leq \gamma$  of the coefficient of static friction  $\alpha$ ,  $\beta$ , and  $\gamma$  of the surface of the final photo conductor belt 1 and the intermediate transfer belt 10 after lubricous agent application, and a transfer paper as a method it is made to become, There are various methods, such as changing the amount of lubricous agent application to the lubricant same besides the method of changing the lubricant to apply, or choosing the original construction material of the photo conductor belt 1 and the intermediate transfer belt 10 in the viewpoint of a surface coefficient of static friction.

[0043]Although the photo conductor belt 1 surface is cleaned using the cleaning blade 15a, it may be made to use the cleaning brush which replaced with the cleaning blade and performed bias application to the conductive brush of low resistance from middle resistance in this embodiment.

[0044]This invention can be applied to all the devices using the technical thought of this invention, without being limited to the above-mentioned embodiment. Any of belt shape, drum shape, and roller geometry may be sufficient as a photo conductor and an intermediate transfer body.

[0045]

[Effect of the Invention]Since the uniform layer of lubricant can be formed in a coated member surface according to the image forming device of claim 1, The toner image from the coated member which applied lubricant to a next process field can be transferred good, and there is an outstanding effect that a good transfer picture without abnormal images, such as worm-eaten, image blurring, and BOSOTSUKI, can be obtained, in the image forming device of an intermediate transfer system.

[0046]Since according to the image forming device of claim 2 a brush like member can be used for spreading of lubricant and lubricant can be applied good over a long period of time, there is an outstanding effect that a good transfer picture can be obtained over a long period of time, with easy composition.

[0047]Since the uniform layer of lubricant can be formed with a braid according to the image forming device of claim 3, there is an outstanding effect that the composition as a lubricant equalizing means is easy, and a good transfer picture without an abnormal image can be obtained certainly.

[0048]There is an outstanding effect that the uniform layer of lubricant can be formed without damaging a coated member surface, since the shock a coated member surface is shocked by contact of a lubricant equalization blade can be suppressed according to the image forming device of claim 4. There is an outstanding effect that the uniform layer of lubricant can be formed without damaging a coated member surface, such even case since the shock a coated member surface is shocked by carrying out relative displacement can be suppressed while a lubricant equalization blade contacts a coated member surface.

[0049]According to the image forming device of claim 5, the uniform layer of lubricant can be formed and there is an outstanding effect that the inferior transfer of the toner image resulting from transferring a toner image from the surface large coefficient-of-static-friction mus side to a small side can be prevented.

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[Translation done.]